

**ABSTRACT**

The invention provides for methods of conjugating biochemical probes onto a solid phase for use in biomedical assays as implemented in conjunction with an optical bio-disc system. The method includes determining the suitability of a test solid phase for purposes of use in a dual bead assay, selecting a test solid phase, conjugating a probe to the test solid phase in the presence or absence of a cross-linking agent, and determining the total amount of probe bound to the test solid phase in the presence or absence of a cross-linking agent. The method is further employed to determine the percentage of probe bound covalently or non-covalently to the solid phase and calculating the percentage of probe bound covalently thereby selecting the solid phase with the highest conjugation efficiency. The invention is further directed at methods for determining whether a target agent is present in a biological sample. A bio-disc for performing a dual bead assay according to these methods is also provided.

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